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SCS ENGINEERS, PC

February 19, 2013
File No. 09204072.05

Ms. Jaclynne Drummond, Hydrogeologist
North Carolina Department of Environment and Natural Resources
Environmental Compliance Solid Waste Section
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

RE: Buncombe County Landfill – Permit # 11-07

Dear Ms. Drummond:

On behalf of Buncombe County Solid Waste Division, SCS Engineers, PC (SCS) submits the following information that relates to test results from the latest groundwater Detection Monitoring event. Groundwater well MW-3 results indicated the presence of vinyl chloride at an exceedance level. This was the first time that volatiles were shown to be present above groundwater protection standards.

A confirmation sampling/testing event was conducted that confirmed the presence of vinyl chloride. Through discussions with the County, no identified events have occurred at the location of the well that might indicate the source of the impact. As a cross-check SCS had an additional sampling event conducted that tested for indicator parameters that could reflect that the impacts may be from landfill gas migration. In addition to MW-3, other monitoring wells in the area of MW-3 along with the background well MW-1 were tested under this process. The other wells tested did not indicate the presence of vinyl chloride. Data gathered is included as an attachment to this letter. A copy of a CDM Smith drawing showing the locations of the groundwater monitoring wells and landfill gas migration monitoring wells is also attached.

The test results indicated the presence of methane in the sample and other indicators including chlorides tended to demonstrate that a likely source of the vinyl chloride in the well is landfill gas. Additionally, the County conducted a field test using their GEM 2000 and found the presence of methane in the well. Ambient readings around the well did not indicate the presence of methane indicating that the methane is in the well and not a surface condition.

Based upon these findings the County is initiating two programs to address the issue. These include Assessment Monitoring and a Landfill Gas Corrective Action. The following addresses the Plan of Action relating to each of the two programs.

Assessment Monitoring

Under 15A NCAC 13B.1634 Assessment Monitoring is required whenever one or more of the constituents listed in Appendix I is detected in exceedance of the groundwater protection

standards. Within 90 days of triggering an assessment program the groundwater must be analyzed under the Appendix II list. For the purposes of this program the 19 wells associated with the MSW landfill are to be included. Four wells associated with the C&D Landfill (MW-12, 12D, 14, & 14D) will not be included in this effort.

It is proposed that the initial sampling event occur beginning April 1, 2013, which coincides with the traditionally scheduled semi-annual sampling/testing event. When the test results are received those wells with detection and exceedances will be identified. In accordance with the above referenced section of the rules, SCS will prepare a suggestion to the North Carolina Department of Environment and Natural Resources (NCDENR) as to a subset of the wells to proceed to the next level.

Under the rules, if it can be demonstrated that the monitoring parameters are not reasonably expected to be in or derived from the waste contained in the unit, the agency may delete any of the parameters from additional testing. While it is obvious that the compounds found in the Appendix I testing are related to the landfill, the direct source appears to be due to the migration of landfill gas. Demonstrating that this is the case will be a component of the effort for the second part of the evaluation.

Note that follow up testing is likely to be required. This may require modifying the schedule for sampling and testing at the New Landfill. Also note that if the concentrations of the Appendix II constituents are shown to be below the approved groundwater standard for two consecutive events, the agency shall give approval to return to routine Detection Monitoring.

Required notifications will be sent to the agency as per the rules.

Landfill Gas Corrective Action

As previously noted, it is believed that the source of the impacts at MW-3 is attributable to the migration of landfill gas. It should be noted that several of the groundwater monitoring wells including MW-3 are relatively close to the waste edge. Many of the wells are located within 150 feet and others less than 100 feet from the waste. Additionally, the County has installed a landfill gas flare and power generation facility on a prepared pad area just up-gradient of MW-3. The County has installed an active gas recovery system that provides the fuel to the power unit and flare.

The first submittal that SCS will prepare will include calculations based on the data from gathered thus far, with the intent of demonstrating that the vinyl chloride in the well is due to the landfill gas. We have already conducted a gas reading directly from MW-3 and from a follow up groundwater testing. In both cases the presence of methane in the well has been confirmed. This along with detections, not exceedances, in MW-7 of 1, 1-Dichloroethane gives cause to attempt to assess if landfill gas is migrating.

To assess this, it is proposed to use the same augur system recently applied at the old landfill to areas between the waste and monitoring wells along the perimeter of the access road. Borings

shall be up to ten feet deep depending on whether or not rock is encountered. This would include the following well locations:

- MW-10/10D
- MW-3
- MW-4/4D
- MW-5/5D
- MW-6
- MW-7

Additionally, during the same period, readings will be made at gas migration monitoring wells M-1, M-2, and M-3.

Should gas be detected additional borings will be conducted to attempt to delineate the gas plume and to assess if the gas is migrating directly from the landfill. In the case of MW-3, boring(s) will also be conducted between the flare pad and the well. At the discretion of the County, temporary gas monitoring wells may be constructed in area(s) where gas is encountered to provide a location to monitor progress of the management practices.

Following the field activities, a report will be prepared to reflect the activities and findings. Alternatives will be developed and analyzed. The report will be provided to NCDENR and a review meeting with agency personnel will be requested to gain insight into the preferred resolution to the issue.

In summary, MW-3 is located well within the limits of the landfill. At this point the exceedance in the well does not serve as an immediate threat to off-site facilities or on-site operations. It is the intent of the described effort to isolate potential sources of the impact on the groundwater and to address preferred alternatives to address the conditions. To finalize the selected alternative, the County along with SCS representatives proposes a meeting with the Raleigh NCDENR staff to discuss the results of the process and to discuss our proposed approach to resolve the issue.

Sincerely,

Ken E. Guilbeault, LEP
Project Manager
SCS ENGINEERS, PC

NORTH CAROLINA PROFESSIONAL 7905 ENGINEER C. EDWARD HILTON, JR.

C. Ed Hilton, Jr., P.E.
Vice President
SCS ENGINEERS, PC
2/25/13

Attachments

cc: Buncombe County

BUNCOMBE COUNTY MW-3 EVALUATION OF IMPACTS ON GROUNDWATER

02/05/13

Permit # 11-07

TEST	MW-3	MW-1	MW-2	MW-4
Methane (ug/L)	1960.0	ND	ND	ND
Calcium (ug/L)	24200.0	8940.0	14100.0	13200.0
Magnesium (ug/L)	14500.0	6160.0	6520.0	5430.0
Potassium (ug/L)	ND	ND	ND	ND
Sodium (ug/L)	12500.0	9690.0	5540.0	6000.0
Alkalinity (Total as CaCO3) (mg/L)	135.0	39.9	53.1	52.6
Floride (mg/L)	ND	ND	ND	ND
Sulfate (mg/L)	7.6	18.4	20.8	19.5
Chloride (mg/L)	3.3	4.2	9.0	3.3
Field pH (Std. Units)	6.0	6.5	6.1	6.1
Field Temperature (deg C)	12.3	10.7	8.3	11.1
Static Water Level (feet)	32.34	72.08	8.52	13.08
Field Specific Conductance (umhos/cm)	293.0	161.0	1.3	156.0
Turbidity (NTU))	140.0	24.3	27.9	23.4

Data taken from report from Pace Analytical dated January 31, 2013

MW-3 = Impacted well; MW-1=Background well; MW-2 and MW-4 located on either side of MW-3.

N740000

N739000

N738000

N737000

SW-6
M-4
MW-2
MW-2D
SW-2
SW-5
SW-1
M-5
MW-13
MW-13D
MW-10
MW-10D
MW-3
MW-4
MW-4D
MW-5D
MW-5
SW-3
M-3
MW-15S
M-10
MW-15D
M-11
SW-4
MW-12
MW-14D
MW-18
MW-12D
MW-9
MW-9D
(BOTH ABANDONED)
MW-6
M-2
MW-7
M-1
MW-8
MW-8D
MW-11
MW-11D
M-7
MW-1
MW-1D
M-9
M-8

N

1" = 200'
100 0 200

LEGEND

- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- MW-10 EXISTING GROUNDWATER MONITORING WELL
- M-3 EXISTING METHANE MONITORING WELL
- M-5 FUTURE PROPOSED METHANE MONITORING WELL
- SW-2 SURFACE WATER MONITORING LOCATOIN

NOTE:

SURVEY OF CELL 6 WAS PERFORMED IN APRIL 2011 BY ED HOLMES AND ASSOCIATES.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: A. WEISPFENNING
DRAWN BY: A. WEISPFENNING
SHEET CHK'D BY: M. COLONE
CROSS CHK'D BY:
APPROVED BY:
DATE: OCTOBER 2011

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BUNCOMBE COUNTY
NORTH CAROLINA

BUNCOMBE COUNTY SOLID WASTE MANAGEMENT FACILITY

GROUNDWATER AND METHANE MONITORING WELL LOCATION MAP

PROJECT NO. 5000-90099
FILE NAME: SITE MAP.DWG
SHEET NO. 1